

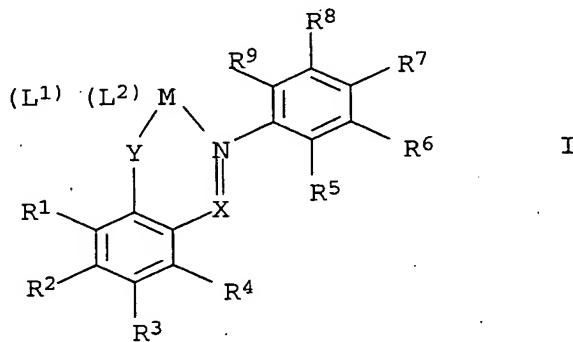
We claim:

1. A process for preparing aqueous polymer dispersions by  
 5 polymerizing one or more olefins in an aqueous medium in the  
 presence of dispersants and, if desired, of organic solvents  
 which comprises catalyzing the polymerization of said  
 olefin(s) using one or more metal complex compounds of the  
 formula I

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where the substituents and indices have the following  
 meanings:

25 M is a transition metal from groups 7 to 10 of  
 the periodic table of the elements,

30 L<sup>1</sup> denotes phosphanes  $(R^{16})_xPH_{3-x}$  or amines  
 $(R^{16})_xNH_{3-x}$  with identical or different radicals  
 $R^{16}$ , ethers  $(R^{16})_2O$ ,  $H_2O$ , alcohols  $(R^{16})OH$ ,  
 pyridine, pyridine derivatives of the formula  
 $C_5H_{5-x}(R^{16})_xN$ , CO, C<sub>1</sub>-C<sub>12</sub> alkyl nitriles, C<sub>6</sub>-C<sub>14</sub>  
 aryl nitriles or ethylenically unsaturated  
 double bond systems, x denoting an integer from  
 35 0 to 3,

40 L<sup>2</sup> denotes halide ions, amide ions  $(R^{16})_hNH_{2-h}$ , h  
 denoting an integer from 0 to 2, and also C<sub>1</sub>-C<sub>6</sub>  
 alkyl anions, allyl anions, benzyl anions or  
 aryl anions,

45 it being possible for L<sup>1</sup> and L<sup>2</sup> to be linked to  
 one another by one or more covalent bonds,

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X: is CR or nitrogen atom (N)

R: is hydrogen,  
 C<sub>1</sub>-C<sub>6</sub> alkyl groups,  
 5 C<sub>7</sub>-C<sub>13</sub> aralkyl radicals or  
 C<sub>6</sub>-C<sub>14</sub> aryl groups, unsubstituted or substituted  
 by one or more C<sub>1</sub>-C<sub>12</sub> alkyl groups, halogens,  
 mono- or polyhalogenated C<sub>1</sub>-C<sub>12</sub> alkyl groups,  
 C<sub>1</sub>-C<sub>12</sub> alkoxy groups, silyloxy groups  
 10 OSiR<sup>11</sup>R<sup>12</sup>R<sup>13</sup>, amino groups NR<sup>14</sup>R<sup>15</sup> or C<sub>1</sub>-C<sub>12</sub>  
 thioether groups,

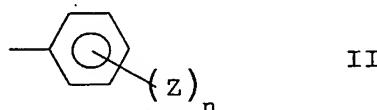
Y: is OH group, oxygen, sulfur, N-R<sup>10</sup> or P-R<sup>10</sup>,

15 N: is nitrogen atom

R<sup>1</sup> to R<sup>9</sup>: are independently of one another  
 hydrogen,  
 C<sub>1</sub>-C<sub>12</sub> alkyl, it being possible for the alkyl  
 20 groups to be branched or unbranched,  
 C<sub>1</sub>-C<sub>12</sub> alkyl substituted one or more times by  
 identical or different substituents selected  
 from C<sub>1</sub>-C<sub>12</sub> alkyl groups, halogens, C<sub>1</sub>-C<sub>12</sub>  
 alkoxy groups and C<sub>1</sub>-C<sub>12</sub> thioether groups,  
 25 C<sub>7</sub>-C<sub>13</sub> aralkyl,  
 C<sub>3</sub>-C<sub>12</sub> cycloalkyl,  
 C<sub>3</sub>-C<sub>12</sub> cycloalkyl substituted one or more times  
 by identical or different substituents selected  
 from C<sub>1</sub>-C<sub>12</sub> alkyl groups, halogens, C<sub>1</sub>-C<sub>12</sub>  
 30 alkoxy groups and C<sub>1</sub>-C<sub>12</sub> thioether groups,  
 C<sub>6</sub>-C<sub>14</sub> aryl,  
 C<sub>6</sub>-C<sub>14</sub> aryl substituted by identical or  
 different substituents selected from one or  
 35 more C<sub>1</sub>-C<sub>12</sub> alkyl groups, halogens, mono- or  
 polyhalogenated C<sub>1</sub>-C<sub>12</sub> alkyl groups, C<sub>1</sub>-C<sub>12</sub>  
 alkoxy groups, silyloxy groups OSiR<sup>11</sup>R<sup>12</sup>R<sup>13</sup>,  
 amino groups NR<sup>14</sup>R<sup>15</sup> and C<sub>1</sub>-C<sub>12</sub> thioether  
 groups,  
 C<sub>1</sub>-C<sub>12</sub> alkoxy groups,  
 40 silyloxy groups OSiR<sup>11</sup>R<sup>12</sup>R<sup>13</sup>,  
 halogens,  
 NO<sub>2</sub> groups or  
 amino groups NR<sup>14</sup>R<sup>15</sup>,  
 it being possible in each case for two adjacent  
 45 radicals R<sup>1</sup> to R<sup>9</sup> to form with one another a  
 saturated or unsaturated 5- to 8-membered ring,

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R<sup>10</sup> to R<sup>16</sup> independently of one another are hydrogen, C<sub>1</sub>-C<sub>20</sub> alkyl groups, which may be substituted in turn by O(C<sub>1</sub>-C<sub>6</sub> alkyl) or N(C<sub>1</sub>-C<sub>6</sub> alkyl)<sub>2</sub> groups, C<sub>3</sub>-C<sub>12</sub> cycloalkyl groups, C<sub>7</sub>-C<sub>13</sub> aralkyl radicals or C<sub>6</sub>-C<sub>14</sub> aryl groups, at least one of the radicals R<sup>1</sup> to R<sup>9</sup> necessarily being in the form of a radical of the formula II below



15 where Z is an electron-withdrawing group and n is an integer from 1 to 5.

2. A process as claimed in claim 1, wherein Z in formula II is 20 one of the following electron-withdrawing radicals:

NO<sub>2</sub>, SO<sub>3</sub>, F, C<sub>m</sub>F<sub>2m+1</sub> where m is an integer from 1 to 10, or a mono- or polyfluorinated aryl.

25 3. A process as claimed in either of claims 1 or 2, wherein Z in the formula II is CF<sub>3</sub> and n is 2 or 3.

4. A process as claimed in any of claims 1 to 3, wherein the 30 metal complex compound is used in combination with an activator.

5. A process as claimed in any of claims 1 to 4, wherein M in the formula I is nickel or palladium.

35 6. A process as claimed in any of claims 1 to 5, wherein ethylene is used exclusively as olefin.

7. A process as claimed in any of claims 1 to 5, wherein at 40 least two olefins are used selected from the group consisting of ethylene, propylene, 1-butene, 1-hexene, and styrene.

8. A process as claimed in claim 6, wherein ethylene is used in combination with propylene, 1-butene, 1-hexene or styrene.

9. A process as claimed in any of claims 1 to 8, wherein anionic, cationic and/or nonionic emulsifiers are used as dispersants.
- 5 10. A process as claimed in any of claims 1 to 9, wherein aliphatic and aromatic hydrocarbons, fatty alcohols or fatty acid are used as organic solvents.
11. An aqueous dispersion of a polyolefin or copolymer of two or 10 more olefins, obtainable by a process as claimed in any of claims 1 to 10.
12. An aqueous dispersion of a polyethylene or copolymer of ethylene obtainable by a process as claimed in any of 15 claims 1 to 10.
13. An aqueous dispersion as claimed in claim 11 or 12 in the form of a miniemulsion.
- 20 14. The use of an aqueous dispersion as claimed in any of claims 11 to 13 for paper applications such as paper coating or surface sizing, paints and varnishes, adhesive base materials, molded foams such as mattresses, textile and leather applications, carpet-backing coatings or 25 pharmaceutical applications.

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## Preparation of aqueous polymer dispersions

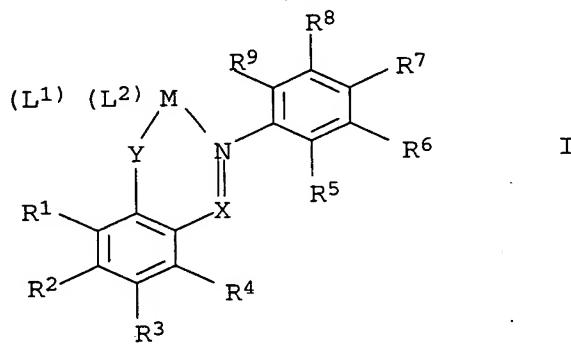
## Abstract

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A process for preparing aqueous polymer dispersions by polymerizing one or more olefins in an aqueous medium in the presence of dispersants and, if desired, of organic solvents comprises catalyzing the polymerization of said olefin(s) using 10 one or more metal complex compounds of the formula I

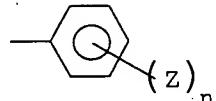
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where at least one of the radicals R¹ to R⁹ is necessarily in the form of a radical of the formula II below

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30 where Z is an electron-withdrawing group and n is an integer from 1 to 5.

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